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The Volume Distribution of Intravenously Injected ^{24}Na in Bovines

BY
J. S. S. INGLIS, F. W. JENNINGS, I. M. LAUDER, W. MULLIGAN and MARY WEIPERS
Glasgow University Veterinary School

RADIOACTIVE isotopes of sodium (^{24}Na and ^{22}Na) have been used extensively in the determination of the "sodium space" in man and the common laboratory animals (see review by Manery, 1951). Since sodium ions penetrate into certain cells and into bone, the space measured by following the dilution of radioactive sodium after injection is a virtual rather than an actual one, and does not correspond accurately to the extracellular fluid volume. A combination of the space determination and estimations of plasma sodium can be used to measure the total "exchangeable sodium" of an animal. Such measurements have been carried out on man by Forbes & Perley (1949, 1951), Warner, Sweet & Dobson (1953), Miller & Wilson (1953).

There appears to be no information in the literature on sodium space and exchangeable sodium determinations on farm animals. It may well be that the application of such techniques to the study of fluid and electrolyte balance in domestic animals will give interesting and useful results.

The present communication deals with the experimental procedure and some preliminary results on radiosodium space determination on bovines using ^{24}Na.

Methods and Materials

Radioactive sodium

^{24}Na as isotonic sodium chloride solution was obtained from A.E.R.E., Harwell. The stock radioactive solution was diluted appropriately with isotonic saline for injection. 10 ml. of a solution containing an activity ranging from 300 μC for adult animals down to about 30 μC for small calves were injected as described below.

A problem which arises in the injection of large animals with radioactive materials is the radiation dosage to the operator during injection, since in general fairly high activities have to be used. The radiation dosage can be reduced either by some system of screening the syringe or by utilising the protection afforded by distance. In the case of ^{24}Na which emits high energy γ rays (1·37 and 2·75 MeV.) adequate screening of a syringe with moderate thicknesses of lead would be difficult (*e.g.*, lead approximately 3 in. thick is required to absorb 90 per cent. of the γ radiation from ^{24}Na). A disadvantage with heavy screening is that the apparatus becomes cumbersome, so that the time spent in the operation is prolonged, thus leading to longer exposure of the operator. We have therefore employed a syringe holder which enables the operator's hands to be kept some distance from the syringe containing the radioactive sodium. This is illustrated in Fig. 1.

The syringe holder (A) is a "Perspex" tube of slightly larger diameter than the syringe to be accommodated, with a section removed as illustrated. The syringe is held in position with rubber bands and the plunger is extended so that the syringe can be held and operated at least 10 cm. away from the active solution in the barrel.

If we consider the radioactive sodium in the syringe as a point source, then the γ-ray dose rate to a hand 10 cm. from 300 μC is about 60 mr. per hr.* The time spent in filling the syringe and carrying out the

FIG. 1.—Apparatus for injection of radiosodium.

injection is normally not more than about two minutes so that the total γ-ray dose to a hand at 10 cm. is about 2 mr.* per 300 μC injection. These figures for γ-ray dose rate and total dose would be 100 times larger at a distance of 1 cm. which is roughly the distance of the hands from the hypothetical point source in the case of a syringe held directly in the hands.

Injection

A venous catheterisation technique similar to that described by Hansard, Comar & Plumlee (1951) was used. A "Portex" polythene catheter (No. 53) was inserted down the left jugular vein by first introducing a wide bore hypodermic needle and then pushing the catheter gently down the lumen of the needle. The needle was then removed leaving the catheter *in situ*. A 20-ml. syringe (B) filled with saline was then connected to the end of the catheter by means of a polythene-rubber tubing adapter as shown in Fig. 1. For the injection, the catheter was first filled by withdrawing a small quantity of blood into the saline syringe. The rubber tubing was then clamped at C by means of a pair of artery forceps, and the ^{24}Na solution injected into the lumen of the rubber tubing and washed into the circulation by opening the clip at C and injecting the 20 ml. of normal saline. The catheter was then withdrawn.

Collection of blood samples

A polythene catheter was inserted as above down the right jugular vein and a polythene-rubber tubing adapter fitted to the end of the catheter. Blood samples were withdrawn by means of a 25-ml. syringe inserted directly into the adapter. 25-ml. samples were collected and each transferred to a bottle containing heparin. After the withdrawal of each blood sample the catheter was filled with heparinised saline and clamped at the rubber tubing with a pair of artery forceps suspended from the neck of the animal. At each sampling the first 5 ml. of blood drawn off through the catheter was rejected to avoid dilution of the blood sample by the heparinised saline. Plasma was separated from the blood samples by centrifugation at 1,500 g. for 1 hour.

Radioactivity determinations

Standard solutions for the radioactivity measurements were prepared by appropriate dilution of the solution for injection with isotonic saline. 10 ml. samples of standard and 10-ml. samples of plasma were counted in an M6 liquid counter (20th Century Electronics). Because of the short half-life of ^{24}Na (15·1 hours, equivalent to about a 4 per cent. drop in activity per hour) it is necessary during a series of counts to correct for decay. This can be done either by using a decay curve or by frequent repeated determinations on the standard. The latter method which we have used also corrects for any variations in the sensitivity of the counting apparatus which may occur.

The standard solution was counted before and after each pair of plasma samples and the mean value of these two determinations on the standard used in relation to the two samples of plasma. Each sample was counted for a sufficient time to give a total of at least 2,500 counts, *i.e.*, an S.D. of about 2 per cent. Two such determinations were carried out on each sample and the mean count rate taken. Where duplicate count rates differed by more than 4 per cent., a third determination was carried out.

* These conditions enable the operator to keep well within the "permissible" levels of radiation dosage.

Results

Disappearance rate of intravenously injected ^{24}Na from plasma of bovines

A number of bovines ranging from three-week-old calves to adult animals were injected with ^{24}Na as described above. Blood samples were withdrawn at intervals after injection and their radioactivity compared with that of a standard prepared from the injected solution. The ratio Cp/Cs, where Cp is the count rate per ml. plasma and Cs is the count rate per ml. for the appropriate standard, was plotted against time on semilogarithmic paper. Figs. 2, 3 and 4 show typical disappearance curves for calves, stirks and adult cows respectively. It can be seen from the curves that there is an initial rapid exit of radiosodium from the plasma which comes to an end at about one and a half hours in the case of calves, and two and a half to three hours in the case of the larger animals. This rapid phase is then followed by a slow exponential decline in the plasma concentration of radiosodium. If one assumes that the rapid initial phase corresponds to the exit of the radiosodium from the plasma into the extravascular spaces and that the more gradual loss is due to penetration into bone, into cells, excretion, etc., a "space" corresponding to the end of the initial phase can be calculated by extrapolating the linear part of the above curves back to zero time and obtaining the value Cp/Cs at that time. Using this value for Cp/Cs, the volume of solution injected, and the dilution of the standard, the radiosodium space can be calculated (see below). The radiosodium spaces which we have determined in these experiments have been calculated on this basis.

Determination of radiosodium space

In the determination of radiosodium space by this method it is not necessary to start collecting blood samples until the flattened portion of the curve has been reached. In order to construct a satisfactory graph it is desirable to have as many points as possible on this straight line portion of the curve. The procedure we have adopted is to take samples of blood at 30-minute intervals from two and a half to six hours. This gives eight points which usually enable a satisfactory line to be drawn as shown in Fig. 5.

The radiosodium space is calculated as follows,

$$^{24}\text{Na space} = V \times \left[\frac{Cs}{Cp}\right]_o \times D \text{ where } \left[\frac{Cs}{Cp}\right]_o \text{ is the value of } \frac{Cs}{Cp}$$

determined by extrapolation to zero time of the linear part of the curve, D is the dilution of the standard, and V is the volume injected.

Two corrections due to the plasma proteins may be applied to this result. (See Gamble & Robertson, 1952.) The first allows for the volume occupied by the proteins in the plasma, the second for the unequal distribution of sodium between plasma and interstitial

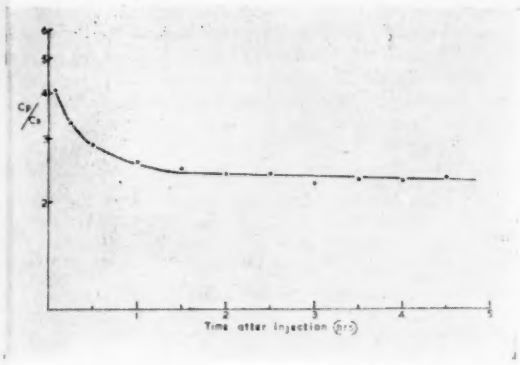

FIG. 2.—Disappearance of intravenously injected ^{24}Na from plasma of calves.

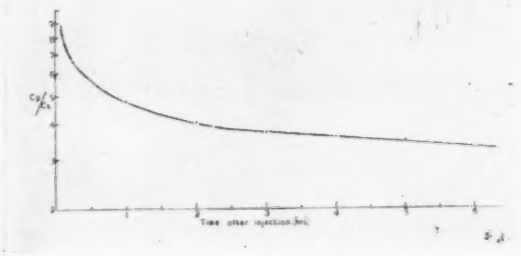

FIG. 3.—Disappearance of intravenously injected ^{24}Na from plasma of stirks.

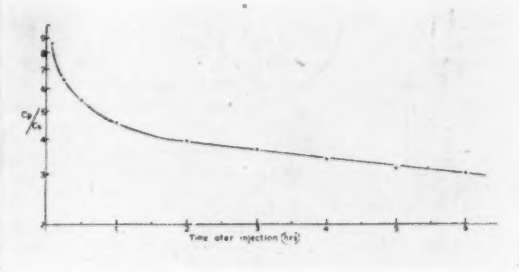

FIG. 4.—Disappearance of intravenously injected ^{24}Na from plasma of cows.

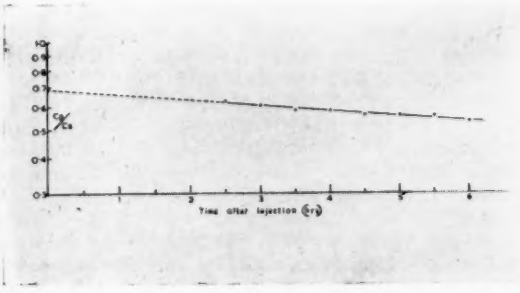

FIG. 5.—Extrapolation of linear part of disappearance curve.

fluid due to the Donnan equilibrium. In both cases the correction is small, and except possibly where one wishes to compare the volume distribution of two ions such as sodium and chloride, there seems to be little point in applying such corrections.

Results of determinations on bovines

Radiosodium spaces were determined on a number of calves, stirks and adult cows. The results of these determinations are shown in Table I.

TABLE I

RESULTS OF RADIOSODIUM SPACE DETERMINATIONS ON BOVINES

Type		^{24}Na space (litres)	Weight (kg.)	^{24}Na space/ kg. bodyweight
Cows	(1)	152·0	610·0	249
	(2)	145·0	445·0	327
	(3)	133·0	534·0	249
Stirks 1–2 years	(1)	99·0	263·0	377
	(2)	97·1	295·0	329
	(3)	87·0	245·0	355
	(4)	71·3	184·0	382
	(5)	81·7	242·0	338
	(6)	87·5	242·0	362
	(7)	68·1	184·0	370
Calves 3–5 weeks	(1)	14·7	34·5	425
	(2)	18·0	45·2	399
	(3)	17·1	44·5	384
	(4)	15·8	36·8	429
	(5)	10·8	28·2	385
	(6)	17·0	39·0	436
	(7)	11·4	25·9	442
	(8)	18·1	44·5	407

Although the number of adults involved is small, it is clear from the results shown in Table I that the radiosodium space is inversely related to age. The relatively greater extracellular space of the young has been established in man by measurement both of the ^{24}Na space and thiocyanate space (Fellers, Barnett, Hare & McNamara, 1949), and on dogs by measurement of the chloride space (see Gamble & Robertson, 1952). Our results for bovines are similar to those found for man and other species (see Manery, 1951).

Repeat Determinations

Four determinations of the radiosodium space were carried out on each of three stirks at weekly intervals. The results are shown in Table II (*see overleaf*).

The agreement between repeat determinations on the same animal is fair. All the animals were at grass during the investigation and some variations associated with differences in the weight of the contents of the capacious rumen are to be expected.

Discussion

The volume distribution of intravenously injected radioactive sodium has been used by a number of workers as an approximate measure of extracellular fluid volume (see Manery, 1951). The sodium in the body, apart from that in the mineral phase of bone, is largely extracellular in distribution and radioactive sodium on injection equilibrates with the inactive sodium of most tissues fairly rapidly (Manery & Bale,

TABLE II
REPEATED DETERMINATIONS OF RADIOSODIUM SPACE

Animal number	Date	Weight (kg.)	^{21}Na space (litres)	^{24}Na space /kg.
F12	25/5	235	80·7	343
	2/6	241	77·5	322
	9/6	265	94·3	356
	15/6	263	99·0	376
				Mean 349
F23	25/5	272	87·9	323
	2/6	277	84·3	304
	9/6	296	90·9	307
	15/6	295	97·1	329
				Mean 316
F39	25/5	214	71·3	333
	2/6	218	68·5	314
	9/6	242	84·8	350
	15/6	245	87·0	355
				Mean 338

1941). There is, however, some exchange with intracellular sodium and with sodium in the insoluble phase of bone (Kaltreider, Meneely, Allen & Bale, 1941 ; Manery & Bale, 1941), and for these reasons, the radiosodium space cannot be regarded as a valid measure of extracellular fluid volume. Nevertheless, the sodium space can be a physiologically important measurement and in clinical studies has been found to parallel approximately the degree of oedema (Warner, Sweet & Dobson, 1953 ; Aikawa, 1952).

Differences in sodium space as measured by different workers are to be expected in view of variations in experimental procedure, *e.g.*, variations in the time allowed for equilibration after injection, the use or not of an extrapolated curve, correction or otherwise for the loss of activity due to excretion. The last factor can usually be neglected in short-term experiments. At present it is still not feasible to correct for the penetration of radiosodium into bone but it is reasonable to assume that the steady fall in plasma radioactivity after the initial drop represents the loss of radiosodium into bone, into cells and by excretion. Therefore extrapolation back to zero time of the linear part of the disappearance curve should enable one to calculate the volume distribution of the injected radiosodium at the end of the rapid mixing phase. This is the method on which our radiosodium determinations are based.

Recently isotopic sodium has been used in the measurement of the total " exchangeable sodium " in the body. The experimental procedure involves essentially a measurement of radiosodium space combined with a chemical determination of plasma sodium. The technique has been applied to man by Forbes & Perley (1949, 1951), Warner, Dobson, Rodgers, Johnston & Pace (1952), Warner, Sweet & Dobson (1953), Miller & Wilson (1953). The exchangeable sodium measured in this way has a physiological reality which cannot be ascribed to the sodium space. The exchangeable sodium is theoretically a more valid measurement and may prove physiologically more important than the sodium space.

In exchangeable sodium measurements on man it is recommended that at least 24 hours be allowed for complete equilibration after injection (Deane, 1952) and for this reason a correction has to be applied for the radiosodium excreted during this period. So far we have not carried out any determinations of exchangeable sodium on bovines, because of lack of facilities at present for collecting all the urine excreted over the prolonged period necessary for complete equilibration. We hope to proceed with such determinations at some future date.

Summary and Conclusions

The experimental techniques involved in the determination of the " radiosodium space " of bovines using ^{24}Na are described. A venous catheterisation method for the quantitative injection of solutions into bovines and the withdrawal of multiple blood samples is described, and a syringe holder which permits of remote control of the injection of radioactive solutions is illustrated.

Results obtained on a number of bovines ranging from three-week-old calves to adult cows are given. It was found that the radiosodium space in bovines, as in other species, is relatively greater in young animals. The general principles involved in " sodium space " and " exchangeable sodium " determinations are described

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ISRAEL VETERINARY MEDICAL ASSOCIATION

Mr. A. Shoshan, M.R.C.V.S., Chairman of the Israel Veterinary Medical Association Legal Sub-committee for the South and Government District Veterinary Officer for Rhovot, has just arrived in this country after completing an official mission in France on behalf of his Ministry of Agriculture. He is a member of the staff of the " Refua Veterinarith," the official journal of the I.V.M.A., and as their public relations officer he is particularly interested in veterinary education in this country. During his present tour of the United Kingdom and Eire, Mr. Shoshan hopes to obtain information which will assist in the setting up of a Veterinary Faculty in Israel.

Ulceration of the Abomasum in a Guernsey Cow

BY

P. J. N. PINSENT and H. E. RITCHIE

University of Liverpool Veterinary Field Station

Introduction

MARR & JARRETT (1955) reported a case of ulceration of the abomasum in the bovine associated with displacement of that organ, and gave a comprehensive review of the literature on the subject. There is little doubt that the condition is comparatively rare in cattle, and our object in making this report is to describe a case of ulceration of the abomasum which showed considerable similarity to that of Marr & Jarrett, except that in our case no displacement had occurred.

Subject

A four-year-old pedigree attested Guernsey cow.

History and Examination

The cow calved for the third time in the first week of January, 1955. Parturition was normal and unassisted and the placenta was expelled normally. The animal appeared to be in good health for three or four days, then appetite gradually diminished and the milk yield fell to a few pounds daily. Her temperature showed considerable variations over the next three weeks, fluctuating between 101·5° F. and 105° F. The owner's veterinary surgeon administered antibiotics with little or no effect upon the cow's condition.

She was first seen by one of us a month after parturition, her condition having gradually deteriorated during the intervening weeks. Her temperature was 101·6° F. and pulse was 72. The respiratory rate was normal, and no abnormalities of heart or lungs could be detected on auscultation. Bodily condition was very poor, most of the ration being left untouched, and no signs of rumination had been observed during the course of the illness. Ruminal movements were completely absent. The mouth and teeth were normal, there was no hyperaesthesia nor were there any other nervous symptoms. The udder was normal but the yield had fallen to 3 lb. daily. Rothera's test for ketones in the milk proved negative. There was slight diarrhoea.

Rectal examination revealed no abnormality of urinary or genital tracts, and the urine was of normal appearance. No grunt could be heard nor was there any "catch in the breath" on pinching the withers. Faecal examination was negative for Johne's bacilli, and liver-fluke eggs, and only 50 worm eggs per gramme were found. Blood was negative for Johne's disease, by Hole's modified complement fixation test.

The serum calcium level was 8·2 mg. per 100 ml., and the magnesium level was 1·3 mg. per 100 ml. The latter figure is somewhat low and was considered interesting in view of the fact that magnesium sulphate in adequate parenteral dosage had been administered, together with calcium borogluconate, three times during the cow's illness. Blood acetone levels were normal.

The total and differential white blood cell counts were as follows :—

Total White Cell Count—4,800 per cu. mm.

	Per cent.		Per cent.
Bands	0·0	Monocytes	7·5
Polymorphs	3·0	Eosinophils	2·0
Lymphocytes	86·0	Basophils	1·5

The significance of this most unusual blood picture is not known.

The cow was seen again by us 10 days later, at which time she had been ill for five weeks. She was very thin and was showing very little interest in food, although dung, dirty straw and dirt were chewed and even eaten with relish; temperature was 102·8° F. The cow was admitted to the Field Station on that day—February 28th—and it was noticed that she licked the manger and the rock salt supplied almost continually, although this habit ceased after two or three days. A frequent soft cough had developed since the last examination and a slight mucopurulent nasal discharge was also present. Diarrhoea had ceased. Urine now contained traces of albumen, and a few red and white blood cells. It was thought possible that these findings were due to contamination of the urine by a slight purulent vaginal discharge which had become noticeable during the past few days.

Very frequent grinding of the teeth occurred, and this remained a feature throughout the illness. The rumen was completely inactive, and remained so throughout almost the entire course of the illness.

Blood levels, taken for examination on admittance to the Field Station, gave the following results :—

Inorganic phosphorus	3·1 mg. per 100 ml.
Haemoglobin	12·0 gm. per 100 ml.

Calcium and magnesium values were not obtained, as the sample bottles were broken in the post. It will be seen that the phosphorus value is somewhat low. The haemoglobin value is normal, but the red blood cell count was rather low—4,140,000 per cu. mm. The total and differential white cell counts were as follows, and taken in conjunction with the previous white cell count tended to negative the possibility of a pyogenic focus :—

Total White Cell Count—4,900 per cu. mm.

	Per cent.		Per cent.
Bands	3·5	Monocytes	6·5
Polymorphs	33·0	Eosinophils	4·0
Lymphocytes	53·0	Basophils	0·0

In an attempt to ascertain the degree of adrenal function, the cow was given 80 units of adrenocorticotropic hormone intramuscularly, and two days later the total and differential white blood cell counts were examined again. The results were :—

Total White Cell Count—8,600

	Per cent.		Per cent.
Bands	5·5	Monocytes	6·0
Polymorphs	47·5	Eosinophils	1·0
Lymphocytes	39·5	Basophils	0·5

A further 80 units of adrenocorticotropic hormone (A.C.T.H.) were given intramuscularly on the same day and the white cell picture was re-examined on the following day. It was then :—

Total White Cell Count—10,750

	Per cent.		Per cent.
Bands	3·5	Monocytes	4·5
Polymorphs	57·5	Eosinophils	—
Lymphocytes	34·5	Basophils	—

The marked increase in the total count, together with neutrophilia, lymphopenia and eosinopenia, was accepted as evidence that the adrenal glands were, at least, capable of response to stimulation, (Merrill & Smith, 1954).

No more A.C.T.H. was given and during the next three days the white cell count swung slowly back towards the original picture. On the fourth day it was as follows :—

Total White Cell Count—4,500 per cu. mm.

	Per cent.		Per cent.
Bands	2·5	Monocytes	5·5
Polymorphs	30·5	Eosinophils	—
Lymphocytes	61·5	Basophils	—

Very little further change in the white cell picture subsequently occurred.

The red cell count fell steadily during the latter part of the illness, and was at the low figure of 3,030,000 per cu. mm. two days before death. The haemoglobin content of the blood fell from 12 gm. per 100 ml. on admittance to the Field Station, to 9·1 gm. per 100 ml. shortly before death, and during this period of progressive anaemia, subcutaneous oedema developed and increased in the dewlap region.

Milk yield never rose above 3 lb. daily whilst the animal was at the Field Station, and it fell to an insignificant amount in the few days prior to the animal's death.

There was little change in the clinical pioture during the first week the cow was under close observation. Temperature varied between 101·4° F. and 102·7° F. and pulse rate between 84 and 97 per minute. Respiratory rate remained normal, but the nasal discharge and soft cough persisted. Appetite remained very poor, and the cow became emaciated. At no time was she seen to ruminate and on one day only were ruminal movements detected, and on that occasion they were very slow and feeble.

It was thought proper, in view of the chronic wasting nature of the disease, to apply the single intradermal comparative tuberculin test. Initial readings were A 5 and the final readings A 5, the test therefore giving M 5 M 8 an inconclusive result. No lesions of so-called skin tuberculosis were present, and it had already been established that the cow was not a case of Johne's disease. Thus the test result provoked some discussion regarding the disease being tubercular in origin.

During the second week at the Field Station the animal deteriorated rapidly. Appetite was almost completely lost, and the emaciation became severe, the cow remaining recumbent for long periods. When standing she was unsteady on her hind legs. Diarrhoea recurred and became profuse, but ceased again on the day before death. Temperature remained in the normal range, and pulse varied between 72 and 98. There was almost constant grinding of the teeth.

The blood calcium and magnesium levels at the end of this week were:—calcium 7·1 mg. per 100 ml., and magnesium 1·4 mg. per 100 ml. Following the taking of these blood samples an intravenous injection of 400 c.c. 20 per cent. calcium borogluconate with added magnesium and phosphorus was commenced, but the cow died before the injection was completed. (February 24th).

Diagnosis

Diagnosis presented considerable difficulty. During the course of our investigations we were able to eliminate Johne's disease, parasitic gastro-enteritis, and chronic fascioliasis. For a time chronic hypomagnesaemia was considered, but the absence of even temporary response to calcium and magnesium therapy tended to refute this suggestion.

Tuberculosis was also considered but apart from the inconclusive test result there was no positive evidence of this disease. The possibility of liver dysfunction was also reviewed, but a careful study of the symptoms throughout the course of the disease led to the conclusion that the alimentary canal was primarily involved, and the persistent inappetence, ruminal stasis, abdominal discomfort, and intermittent diarrhoea suggested the possible presence of an abomasal lesion.

Post-Mortem Examination

The striking abnormality was a circular ulcerative lesion in the mucous membrane of the greater curvature of the abomasum, approximately the size of a florin. The edges of the lesion were rounded and overhanging, and led into a cavity the sides and base of which were formed by omental fat with some strands of fibrous tissue running through it. It appeared that the ulcer had perforated, and had been sealed off by adhesions to the omentum. Histologically the omental fat in this region showed evidence of fat necrosis.

It was interesting that a zone of necrotic material at the base of the ulcer was packed with a branching fungal mycelium, extending deeply into the abomasal fat. The entire lesion was a little larger than a clenched fist, and there seems no reason to doubt that it was longstanding.

No macroscopic lesions of tuberculosis were found anywhere in the carcase, lymph nodes or viscera. The rest of the carcase showed only those changes compatible with severe emaciation.

Discussion

In contrast to the case reported by Marr & Jarrett (1955) this one showed no displacement of the abomasum, nor indeed any other lesion except the ulcer, and so there is little doubt that such an ulcer, *per se*, is sufficient to cause a severe and fatal clinical

(Continued at foot of col. 1, page 771)

PINSENT, P. J. N., & RITCHIE, H. E.—ULCERATION OF THE ABOMASUM IN A GUERNSEY COW

FIG. 1.—Surface view of the abomasal ulcer.

FIG. 2.—Transverse section through the abomasal lesion.

Hyaluronidase in the Treatment of Urethral Calculi

BY

H. P. HARDING

Department of Veterinary Pathology, University of Liverpool,

AND

G. R. SUMNER

Woolton, Liverpool

A MALE Pembroke Corgi, three years old, had a history of difficulty in urination, and a urethrotomy had been performed to relieve obstruction before the dog came to this district.

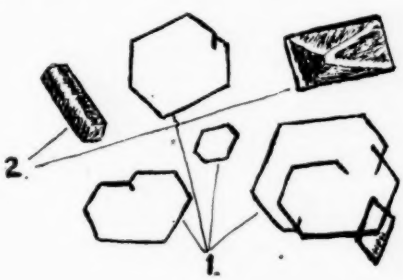
When first seen, the dog was suffering from urethral obstruction with gross bladder distention, urine escaping a few drops at a time, and there was a marked systemic reaction. Catheterisation was impossible and urethrotomy had to be performed at two sites in order to remove all the calculi which were present. The dog made a good recovery from the operation, but less than three months later was presented with a recurrence of its symptoms. On this occasion, the obstruction was rather less severe, as by repeated straining the dog was able to void sufficient urine to prevent the development of acute retention.

A urine sample was examined at this stage. It showed the presence of a trace of albumin and a few red blood cells. There were also a small number of large epithelial cells. The main finding was the demonstration of numerous crystals of cystine, with a small proportion of crystals of triple phosphates. It had a pH of seven.

A third operation being deemed impracticable, it was decided to use hyaluronidase; 9 mg. of Rondase were injected, and eight hours later the dog voided a large number of caluli, completely relieving the obstruction and the symptoms. Further injections of 9 mg. of Rondase were given on each of the next two days, then 3 mg. twice weekly for six weeks and thereafter 3 mg. once weekly. These injections were given on Sunday mornings, and the dog remained free from any symptoms from Sunday to Friday morning each week. On Friday (p.m.) and Saturday, however, evidence of urinary irritation—frequency of micturition and occasional slight straining occurred—relieved completely within a few hours of the Sunday injection.

The dog was maintained in this way for four months, and then had to be destroyed for reasons completely unconnected with this case.

At the *post-mortem* examination, performed on a Friday, the dog was found to be in excellent condition,



1. Cystine.
2. Triple Phosphate.

and no macroscopic lesions could be demonstrated apart from the presence of a few small calculi in the bladder. They did not appear to be exciting any reaction, and on analysis proved to consist entirely of cystine. Histologically, all the tissues examined appeared to be normal.

Discussion

Hyaluronidase was used on the assumption that it would function as a hydrophilic colloid and prevent the

(Continued from page 770).

syndrome in which the outstanding features were the absence of any rumination or ruminal movements, the abdominal discomfort. indicated by the continual grinding of the teeth, and the progressive emaciation.

It is interesting that the lesion was in exactly the same position, and very similar in appearance to that of Marr and Jarrett, and that the history of the two cases was similar, both as regards time after parturition when ill health occurred, and as regards the general clinical syndrome, although their case presented certain additional signs associated with the abomasal displacement.

The aetiology of the condition must remain in doubt. Marr and Jarrett described their case as one of peptic ulceration. The writers would prefer to withhold the word peptic until more is known of the aetiology of the condition, but it seems quite possible that the ulcer may have been analogous to the gastric ulcer of the human subject. The absence of pus and fibrous tissue reaction tends to negative the possibility of the lesion being traumatic in origin. Whether or not the fungal mycelium was a primary or a secondary factor is, of course, unknown, although it is interesting that Gleiser (1953) reports a case of gastric ulceration in the dog associated with fungal invasion of the wall of the stomach.

Summary

A case of ulceration of the abomasum in a Guernsey cow is described and discussed.

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further growth of calculi, as it has been shown to do in sheep (Puntriano, 1954, 1955). Its dramatic action in relieving the obstruction was somewhat unexpected and would only be likely to occur when there was a sufficient flow of urine to bring the hyaluronidase into contact with the calculi causing the obstruction. It is assumed that by forming a molecular film on the surface of the individual calculi, and also due to its effect in reducing the surface tension of the urine, the adherence of one particle to another was reduced leading to disintegration and flushing away of the obstruction. It is important that adequate hyaluronidase is present, as in the presence of only traces of hydrophilic colloid there may well be an increased tendency towards the aggregation of particles.

It is appreciated that a single case does not form an adequate basis for a report, but it is felt that, as the treatment can at its worst cause no harm and at its best may well prove very useful, it may be worth a clinical trial in suitable cases of urolithiasis. As there always seems to be a tendency for the recurrence of calculi of any type, it would obviously be desirable to establish their composition in each case and then institute appropriate measures, such as acid or base administration, or alterations in the diet, for long term control of the condition.

Cystinuria is generally regarded as a rare congenital, metabolic disorder, almost invariably affecting the male. It appears to be of no significance apart from the formation of calculi, which are very prone to lead to urethral obstruction. Some reduction in the output of cystine can be effected by reducing the amount of sulphur containing protein in the diet, but the best measure of control would appear to be alkalinisation of the urine by large doses of bicarbonate or citrate, which increase the solubility of the cystine sufficiently to prevent crystalisation.

The condition appears to be commoner in the dog than in man, for White (1944), in a series of 31 analyses of urethral calculi, found that 15 were pure cystine and two were mixed cystine and phosphate. In the present case, the first examination of urine showed cystine and phosphates but, subsequently, when the retention had been overcome, no phosphates were demonstrable. A number of other workers have reported cases of canine cystinuria (Morris, Green, Dinkel & Brand, 1935 ; Pollock, 1955) but, on the other hand, Brodey (1955), in a series of 52 cases of canine urolithiasis, found no instances of cystine ; and in routine urine examinations carried out in this laboratory, no other cases of cystinuria have been demonstrated during the past five years. It thus appears that very considerable variations in the incidence of the condition occur.

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Grass Tetany in the Ewe

BY

RICHARD H. C. PENNY,

AND

JOHN H. S. ARNOLD

Leighton Buzzard

RECORDS of the occurrence of clinical magnesium deficiency in the ewe in this country are uncommon. Pook (1955) reporting on an outbreak, describes the symptoms and discusses prophylactic measures. He gives blood analyses of a representative sample of sheep in the flock, but blood samples were not obtainable when the ewes were found in convulsions. From Ireland comes a report by O'Moore (1955) who encountered this condition in a flock of Cheviot ewes grazing two-, three- and four-year leys. As a prophylactic measure he suggested feeding calcined magnesite mixed with spice. Blumer *et al.* (1939) reports on 16 outbreaks in Australia, but hypomagnesaemia was not confirmed by the blood samples. Udall (1954) mentions grass tetany in sheep and Newsom (1952) states that the condition is common in certain areas of the U.S.A. He remarks that unlike normal milk fever the phosphorus levels are not decreased. Barker (1939) dealing with hypocalcaemia and hypomagnesaemia in cattle records a lowered inorganic phosphorus in most cases of tetany. In this practice we have observed the condition for some years, but it is on the increase due, in all probability, to improvements in pasture management and ley farming.

On April 18th, 1955, we were called to see three ewes down in convulsions. These belonged to a flock of 80 half-bred ewes that were turned from a permanent pasture on to a fourth year ley on April 16th, 1955. This consisted mainly of white clover, rye grass, timothy and fescues and it had been treated with two cwts. per acre of I.C.I. complete fertiliser 14 days previously. In many places the fertiliser granules could still be seen and nowhere was there a profuse growth of grass. The owner returned the sheep to the old pasture and brought in the three affected ewes.

For identification purposes the three ewes were numbered one, two and three and they were all in convulsions. The condition in each case was good and temperatures were 103°, 104° and 102·8° F. respectively. Breathing was grossly accelerated and there was grinding of the teeth and frothing at the mouth. All had twin lambs aged about four weeks and all were in full milk. Each ewe was given 50 c.c. of a proprietary mixed "milk fever" injection intravenously after blood samples had been drawn. Number one died whilst being injected. Numbers two and three received 50 c.c. of the same mixture subcutaneously and 20 c.c. of a 20 per cent. magnesium solution were also given subcutaneously.

Within 10 minutes ewe number three was much improved and was sitting up. Ewe number two could sit up with support. A similar subcutaneous dose was given to each ewe at night when both were able to stand ewe number three appearing almost normal. The following morning the injections were repeated and one ewe was retained in the stack yard and the other turned

out. Both made uneventful recoveries. The reports on the blood samples are tabulated below :—

		1	2	3
Calcium	mg.p.c. serum	3·6	3·2	4·2
Magnesium	" "	0·8	0·7	0·7
Acetone		——— normal———		
Inorganic P.	" "	2·2	2·3	1·3

The normal levels for sheep blood (Udall 1954) collected from several sources are given as :—

Calcium	mg.p.c. serum	9–12
Magnesium	" "	2·6
Inorganic P.	" "	2·5–9

Discussion

From the above analyses it will be noticed that all the levels for the three main mineral constituents of the blood were low. They compare very closely with analyses from bovines showing a similar condition, but unlike cases described by Newson, phosphorus levels were also low. Blood sampling was not difficult, despite the ewes being in convulsions, and was carried out after removing the wool from the jugular furrow and surrounding area with a pair of shears and applying a fine cord around the base of the neck. On swabbing the area with spirit the jugular vein was clearly visible and extension of the neck by the ewe in tetany helped in the drawing of the blood.

No further cases have been encountered in this flock so far, and in all probability this is due to the prompt removal of the ewes from the ley. Trough feeding was recommenced at the previous rate of 2 to 3 lb. per day, as the permanent field was very bare, and 1 oz. of calcined magnesite per ewe per day was included in the ration. On May 1st, 1955, the ewes were turned on to another permanent pasture.

The writers feel these cases worthy of recording owing to the scanty references to this condition in the literature, and in view of the fact that blood samples were obtained from each case at the time of examination.

Acknowledgment.—Our thanks are due to the staff of the Bio-Chemistry Department, The Ministry of Agriculture and Fisheries, Veterinary Laboratory, Weybridge, for the blood analyses.

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SWINE FEVER—REGISTERED VACCINATED HERDS SCHEME

The Ministry of Agriculture, Fisheries and Food and the Department of Agriculture for Scotland confirm that, as from October 1st, the charges for crystal violet vaccine supplied under the Swine Fever—Registered Vaccinated Herds Scheme have been reduced from 4s. 6d. to 4s. od. for a dose of 10 c.c. and from 2s. 3d. to 2s. od. for a dose of 5 c.c. These reductions are to be passed on to farmers whose pigs are vaccinated under the scheme.

Victoria Veterinary Benevolent Fund

ANNUAL GENERAL MEETING OF THE LADIES' GUILD

The 24th Annual General Meeting of the Ladies' Guild was held in the Senate Room, Queen's University, Belfast, on Thursday, September 8th, 1955.

The President, Mrs. Dinah McNabb, B.A., DIP.ED. (DUBLIN), M.P., welcomed the following ladies:—

Mesdames Black, Barclay, Christie, Clark, Coward, Crooks, Finlay, Forster, Grunsell, Greeny, Glover, Gordon, Hodgins, Heath, Harper, Ingram, Jennings, Jones, E. McF. Jones, Kerr, Kelly, Luke, Lamont, Marshall, Maybin, Matton, Mitchell, McLean, Pearson, F. M. Ritchie, Rassborough, Stratford, Stuart, Shanks, Smith, Sim, Shaw, O. Thompson, J. M. Thompson, R. Thompson, R. Wilson, M. C. Wilson, Whyte.

Apologies for absence were received from Mrs. Hill-Owens, Mrs. Ritchie, Coventry, Mrs. G. H. Wooldridge, Mrs. Robertson and Mrs. Oliver.

Absence of the Hon. Secretary

A letter from the Hon. Secretary (Mrs. Hill-Owens) was read, explaining her inability to attend owing to the illness of her father, and it was agreed that a telegram of good wishes should be sent.

In the absence of the Hon. Secretary, Mrs. W. Kerr, Hon. Divisional Secretary, very kindly deputised.

Minutes and Correspondence

The minutes of the 23rd Annual General Meeting were read, approved, and signed by the President.

Letters of appreciation and thanks from W. Francis, Esq., Secretary of the V.V.B.F., and a précis of other letters from grateful recipients submitted by the Hon. Treasurer were read.

Hon. Secretary's Report

Mrs. Hill-Owens said:— "It is with much regret that I am unable to be present in person to give my report, but the Guild has been running very smoothly. One of our members, Mrs. Blakemore, has suffered a tragic bereavement in the sudden death of her husband, Professor Blakemore, and I conveyed our deepest sympathy which Mrs. Blakemore has since acknowledged.

"To our President, Mrs. McNabb, we render our very warm appreciation for all the work she has done, and to Mrs. Kerr and Mrs. Luke we also extend our sincere thanks. A great deal of work is done by the Local Ladies at each Congress, and this year Mrs. Lamont has undertaken the laborious duty of conducting the raffle for which the Funds are greatly indebted to her.

"To the Treasurer of the Guild we extend our warmest thanks for another year's work, and trust she will be able to continue to serve the Guild for as long as her duties as the wife of a very busy man permit.

"Once again we offer our sincere thanks to Mr. Knight and to Miss Smith of the B.V.A., and also to Mr. Francis at R.C.V.S.

"Two new Divisions have been formed, one in the Midlands by Mrs. S. Ritchie and one in Norfolk and Suffolk by Mrs. McLintock and Mrs. Waddington, and we hope they will prosper."

Treasurer's Report

"The balance of £975 standing at the bank is once again a wonderful testimony to the generosity and very hard work of our members during the past year. It gives me great pleasure to put on record our gratitude to all who have given so much of their time and thought to the work of the Guild. We have raised £925 this year—the balance of £50 being the sum left in reserve last year.

"The extracts from the letters of thanks which were sent out last year will have shown, quite clearly, how much our efforts are appreciated.

"A very good start has been made this year by the new Division in the Midlands and the interest there is most encouraging. Once again personal contact has done what it would be impossible for any Treasurer to do over such a vast area as the greater part of England. Similar help from the Southern Counties will be most welcome."

The following are details of receipts:—

Proceeds from Raffle (£90 10s.) and Dance £147 8s.

	£	s.	d.
Torquay	237	18	0
North Wales	67	0	0
South Wales	100	0	0
Midlands	40	10	0
Lancs. and Cheshire	23	0	0
Treasurer	82	12	0
Scottish Branch Subs. and Donations ...	62	15	6
Ayrshire Dance arranged by Mrs. Wilson	45	0	0
Dumfries Dance arranged by Mrs. Sangster	85	0	0
Penrith Dance arranged by Mrs. Barr	71	15	0
Aberdeen Dance arranged by Mrs. Service	67	0	0
Kirkcaldy Dance arranged by Mrs. H. Wilson	42	12	2
	925	2	8

Allocation of Money

It was resolved to allocate the following sums:—

	£	s.	d.
V.V.B.F. Donation for Current Relief	350	0	0
V.V.B.F. For Christmas and Summer Gift Fund	600	0	0
	950	0	0

Current Literature

DIGEST

Traumatic gastritis

A survey of traumatic gastritis in Australia by Blood & Hutchins (1955), revealed that wire was the most common causal agent, and that 90 per cent. of affected animals were fed chaff made from wire-baled hay. Wire was also incriminated as the cause of 60 per cent. of cases of traumatic gastritis in the U.S.A. from a survey of 44,000 carcases by Maddy (1954), who also found evidence of the disease in 70 per cent. of the dairy cattle examined. The feeding of unchopped hay, or the use of string for baling, are recommended as a means of reducing the incidence of traumatic gastritis.

The Australian workers observed that sudden and complete cessation of feeding was a feature of all cases of traumatic gastritis. Ruminal atony, defined as less than one ruminal movement a minute, was most marked in the first 48 hours of the disease. The abdominal discomfort shown by an affected animal varied with the individual, and when attempting to elicit a grunt by percussion of the abdomen (just behind the xiphoid cartilage), the authors advise the application of a stethoscope to the trachea. An initial temperature of 105° F. or above, and a heartbeat rate in excess of 90 to the minute, are considered unfavourable signs. In seven cases where perforation of the pericardium occurred, the foreign body penetrated the pericardial sac within three to nine days of entering the wall of the reticulum.

The authors recommended immobilisation, by keeping the patient haltered, and raising the standing so that the fore legs were 6 to 8 in. higher than the hind legs. Therapeutic measures consisted in the administration of antibacterial drugs. Fifty-two animals received this regimen, of which 90 per cent. of those treated on the first day recovered, as opposed to only 50 per cent. where treatment was delayed for more than four days. However, cows more than six months pregnant were not good subjects for this treatment, and immediate rumenotomy is advised in these cases. The high proportion of dairy cattle which showed evidence of traumatic gastritis in the American survey suggests that a number of cases recover spontaneously without professional treatment probably after two or three days of what the farmer classified, not inaccurately, as "indigestion."

Blood & Hutchins are of the opinion that the atony of the rumen and reticulum, which follows entry of the foreign body into the gut wall, arrests the progress of the penetration with the result that the foreign body, in many cases, falls back into the reticulum, where it is eventually corroded away by the digestive juices. The deposition of fibrous tissue, or the presence of adhesions, at the site of the puncture reduce the chances of further wounding. D. W. J.

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ABSTRACTS

The Control of Swine Fever. GRANT, W., MCNIVEN, A. M., MACLEOD, A. M., & URQUHART, A. M. (1955). *St. vet. J. Minist. Agric. Lond.* **10.** 67-69.

The authors described three outbreaks of swine fever in which the disease had shown itself in isolated parts of the affected premises. In each case, all the ailing pigs were destroyed and immediately buried. The healthy in-contact pigs were removed, under licence, for immediate slaughter, and the buildings thoroughly disinfected. All the remaining pigs including the unweaned piglets, were inoculated with large doses of hyperimmune serum, and, ten days later, were vaccinated with full doses of crystal violet vaccine.

In each case, no further deaths occurred after the use of serum and the herds were released from restrictions with the minimum of delay.

The authors emphasised the need to destroy all the ailing pigs, remove all their immediate in-contacts for slaughter, and carry out a meticulous disinfection. They consider that provided these precautions are taken, and provided the owner appreciates the risks involved and the cost of the treatment, this serum-vaccine method of treatment can be recommended for use on premises where the disease has shown itself to be localised.

E. A. G.

Salmonella Infection in Carcase Meat. Report by the Salmonella Sub-committee of the P.H.L.S. (1955). *Mon. Bull. Minist. Hlth. Lab. Serv.* **14.** 132-138.

During the four years of 1950 to 1953, samples taken from the carcases of cattle, calves and pigs slaughtered at six English abattoirs were examined bacteriologically for the presence of salmonella organisms.

Of the 45 strains of salmonellae isolated from cattle, 42 were *Salmonella dublin* and three *Salmonella typhi-murium*. The incidence of infection was low, being slightly higher in the Irish cattle that were examined. Thus, salmonellae were isolated from the faeces of five out of 550 (0.9 per cent.) Irish cattle, but from only one out of 354 (0.3 per cent.) English cattle. Swabs were taken from the peritoneal surface of 1,518 sides of beef, but these gave negative results, suggesting that the risk of beef being contaminated in the abattoir is small. No salmonellae were isolated from the liver and spleen of 494 calves.

From pig material, *S. dublin* was isolated nine times, *S. typhi-murium* three times, and *S. anatum* once. All the isolations of *S. dublin* were made at the Newcastle laboratory and it is suggested that the relative frequency of this organism in pigs may be a feature of that district. Elsewhere the incidence of salmonellae in pigs was low. Thus, only one isolation (*S. typhi-murium*) was made from 409 samples of mesenteric lymph nodes.

E. A. G.

Human Infection with Contagious Pustular Dermatitis. LONGMORE, J., *cited by* GREGORY, H. C. (1955). *St. vet. J. Minist. Agric. Lond.* **10.** 55-56.

The author described the infection that followed an injury sustained while examining a case of orf in a lamb. The injury appeared to heal normally within 10 days, but about two days later, a small, purplish papule appeared. During the next three weeks this increased in size to about half an inch in diameter. The lesion gave rise to intense intermittent irritation. The axillary lymph node was enlarged, but there was no pyrexia or malaise.

A few days later numerous vesicles appeared on the hands, wrists and neck. A course of chloromycetin was given together with antihistamine preparations and phenobarbitone to control the intense irritation. Six days later these lesions were regressing, but a few mouth ulcers were evident. The malaise continued for a further two weeks. The site of the primary lesion remained insensitive for several weeks, while small whitish nodules persisted for several months at the site of each secondary vesicle. The circulation of the hands was also impaired.

The identity of the infection was confirmed by laboratory examination.

E. A. G.

The Control of Northern Feather Mite on Chickens. EDGAR, S. A., & MCANNALLY, B. D. (1955). *Poult. Sci.* **34.** 91-96.

The authors tested 12 compounds, including sulphur, nicotine sulphate, DDT, sodium fluoride and lindane (the gamma isomer of BHC) with a view to finding the most effective and economical method of eradicating the Northern Feather Mite (*Liponyssus sylviarum*) from birds on built-up litter or in metal cages.

For the treatment of birds on litter they recommend the use of commercial dusting sulphur, sprinkled over the litter and in the nest boxes at the rate of 2 lb. per 100 square feet. Two applications should be given at an interval of 7 to 10 days.

A nicotine sulphate spray is recommended for the treatment of birds in cages. This was prepared as a 1 : 6 dilution in water of 40 per cent. nicotine sulphate, and applied with a spray attached to a vacuum cleaner, each bird receiving about 2.5 ml. of the solution. One application of 2 or 4 ml. of 1 per cent. toxaphene was equally effective.

None of the treatments used showed any harmful effects on the health or egg production of the birds. Operators are advised to wear a mask while spraying nicotine sulphate.

(In view of the dangers associated with the handling of nicotine sulphate, one would prefer to recommend the use of BHC preparations or of a piperonyl butoxide aerosol, as suggested by Brander (1953), *Vet. Rec.*, **65,** 254. *Abstractor.*)

E. A. G.

News and Comment

SECOND WORLD CONGRESS ON FERTILITY AND STERILITY

The International Fertility Association is sponsoring the Second World Congress on Fertility and Sterility which is to be held in Naples from May 18th to May 26th, 1956. The Congress has been divided into 12 sections dealing with every aspect of fertility and sterility and includes papers on endocrine and metabolic factors, new methods of diagnosis of male and female sterility, diagnosis and treatment of disorders connected with ovulation and spermatogenesis, surgery of male and female sterility, together with experimental investigations and problems in animal reproduction.

Professor T. Bonadonna of the Universities of Camerino and Milan, as Co-Chairman of the World Programme Committee, is responsible for the organization of the veterinary section which will be introduced by Professor Nils Lagerlöf of the Royal Veterinary School, Stockholm, with a general lecture on " Biological Aspects of Male Infertility."

The second of the three major papers planned for the meeting will be given by Dr. T. Mann of Cambridge University on the subject of the " Biochemistry of Semen," and Dr. J. A. Laing of Bristol University will be one of the openers to a paper on " Early Embryonic Vitality in Domestic Animals " by Dr. Chueh Chang of the United States. A German veterinarian, Dr. R. Gotze, is to deliver the first of the major papers in this section under the title " Hereditary and Congenital Factors in Male Infertility," and practically every country in Europe will be represented by speakers at the Congress. Dr. S. W. van Rensburg of South Africa will give the first of a series of shorter papers and a contribution is expected from Mr. E. A. Rowson of Cambridge. Contributions are also planned by veterinarians from Colombia, Egypt, India and Japan, so the Congress should have a truly international flavour.

A scientific exhibition is to be held during the time of the Congress, and books and films will also be on view. Professor Edmundo G. Murray, the Chairman of the World Programme Committee, is responsible for the organisation of the Congress and the exhibition, and correspondence should be addressed to him at Ayacucho 1375, Buenos Aires, Argentina, before February 1st, 1956.

BIOLOGICAL ASPECTS OF THE TRANSMISSION OF DISEASE

A symposium on this subject was held at the London School of Hygiene and Tropical Medicine from September 29th to October 1st, under the auspices of the Institute of Biology. The speakers came from a wide range of biological, veterinary and medical fields, and the meeting was well attended throughout.

The papers were grouped according to the methods of transmission, *i.e.* passive, direct contact between individuals, and indirectly, through an intermediate host, regardless of the type of organism concerned. This treatment helped to bring out similarities between methods of transmission of a wide variety of organisms. While the subject was rather too wide to hope for the emergence of any general principles of universal application, there was much stimulating discussion and many people will have gained new ideas for approaching problems of disease transmission in their own subjects.

Papers of veterinary interest included the following: — " Bacteria of Veterinary Importance and their Transmission by Non-biological Agencies," by Professor R. Lovell; " Factors Affecting the Transmission of Coccidia and the Development of Disease in Fowls," by Dr. C. Horton-Smith; "The Transmission of Helminths of Veterinary Importance," by Dr. E. L. Taylor; " The Transmission of Viruses to Vertebrates by Arthropods," by Professor G. W. A. Dick; " The Transmission of Trypanosomes and its Evolutionary Significance," by Dr. C. A. Hoare, F.R.S.; and " Properties of some Infective Agents in Relation to their Modes of Transmission," by Professor W. I. B. Beveridge.

Many speakers congratulated the organisers on their efforts in bringing together workers from such diverse subjects, and as one of the original advocates of this symposium, Dr. Horton-Smith must feel very gratified at the enthusiastic response it received.

VETERINARY SERVICES IN KITWE, NORTHERN RHODESIA

The Municipal Council of Kitwe, Northern Rhodesia, are most anxious to obtain the services of a qualified veterinary surgeon. Kitwe and the adjacent township of Nkana are situated on the Copperbelt and have between them a European population of approximately 9,000, but there is no veterinary surgeon in the area. The Municipal Council believe that there are admirable facilities here for the setting up of a veterinary practice, and further information can be obtained from the Town Clerk, Mr. S. W. Coleman, P.O. Box 70, Kitwe, Northern Rhodesia, while general information as to life in Rhodesia can be had on application to the Commissioner for Northern Rhodesia, 57, Haymarket, London, S.W.1.

POULTRY (STOCK IMPROVEMENT) ADVISORY COMMITTEE

The Minister of Agriculture, Fisheries and Food, the Rt. Hon. D. Heathcoat Amory, M.P., has reconstituted the Poultry (Stock Improvement) Advisory Committee which now provides for direct representation of the main poultry producers' organisations and of the British Veterinary Association as well as including members appointed to serve in their individual capacities.

The Committee, originally set up in 1945, has been re-appointed for a further year under its original terms of reference, *viz.*, " to keep under review the position of the stock producing and distributing sections of the poultry industry, to advise on existing measures designed to encourage the production of high quality breeding stock, and to suggest from time to time any further steps which they would consider it desirable to be taken to secure that end." During its last term of office, which ended recently, it was concerned mainly with the development of the poultry progeny testing scheme which is to be introduced as soon as the testing stations are ready.

Mr. H. Hardman, Deputy Secretary, Ministry of Agriculture, Fisheries and Food, has been appointed Chairman, and Dr. W. R. Wooldridge, M.SC., M.R.C.V.S., F.R.I.C., will be the B.V.A. representative on the Committee. Other members of the Committee include Messrs. W. J. Welford and C. J. Harrisson of the National Farmers' Union; J. G. Penny, M.B.E., J.P., and J. R. Harvey of the Poultry Association of Great Britain (S.P.B.A.) Ltd.; W. R. Charnock and F. Horner of the Accredited Poultry Breeders' Federation, Ltd.; F. H. Grove and D. G. Sutcliffe of the Chick Producers' Association.

Dr. R. Coles, M.SC.(ECON.), M.SC.(AGRIC.), B.A., Chief Poultry Advisory Officer to the Ministry, is also on the Committee together with Messrs. D. T. Davies, J.P., H. R. Finn, G. Guttridge, C. Hedderwick, O.B.E., J. C. Holland, J. Kemp, M.B.E., J.P., Miss E. E. Kidd, Col. C. E. L. Lyne, M.C., Messrs. J. Rossall, B. Stansfield, J.P., and J. Sutton, M.B.E.

FELLOWSHIPS FOR ADVANCED STUDY

Commonwealth Fund Fellowships available to British subjects for study and travel in the United States of America were inaugurated in 1925 by the Commonwealth Fund of New York, and are now under the patronage of Her Majesty the Queen.

There are six categories of Fellowships open to British subjects who are not normally resident in or near the Americas and who have not previously worked or studied for more than a few months in the United States. These include 20 General Fellowships which are offered to degree graduates of a university in the United Kingdom, and applicants must be available for interview in London in March, 1956. The closing date for applications to this section will be December 15th, 1955.

Two Fellowships are offered under the Home Civil Service category to permanent members in the scientific and professional grades of the Civil Service in Great Britain, while five similar Fellowships are available to Civil Servants in the Governments of Australia and New Zealand, and two more to those in the employment of the Governments of the British Colonies, Protectorates, and Trust Territories. Four Fellowships will be available to faculty members appointed to or holding posts in American studies in the United Kingdom, but these will not be limited by previous study in the United States.

Conditions of eligibility, award and tenure, and the emoluments offered for each category of the Fellowships are published in separate memoranda. Applications should be submitted on the prescribed form which, together with all the necessary information, may be obtained through British Universities, Government Departments, or direct from The Warden, Harkness House, 35, Portman Square, London, W.1.

FOOT-AND-MOUTH DISEASE RESEARCH INSTITUTE

The Minister of Agriculture, Fisheries and Food and the Secretary of State for Scotland, after consultation with the Agricultural Research Council and the Medical Research Council, have jointly appointed Mr. Stephen Cheveley, O.B.E., to be Chairman of the Governing Body of the Foot-and-Mouth Disease Research Institute at Pirbright, Surrey, in succession to Professor Wilson Smith, M.D., F.R.S., who is retiring from the Governing Body.

Mr. Cheveley, who is also Chairman of Central Agricultural Control, Imperial Chemical Industries, Ltd., took up his new appointment as from October 1st, 1955.

NEW MEMBERS OF THE R.C.V.S.

The following graduates were admitted to membership of the Royal College of Veterinary Surgeons on the date shown against their entries:—

BLAIR, Ruth Joyce (Mrs.), Fairhaven, Trearddur Bay, Anglesey. September 27th, 1955. B.V.SC. (LIV.).

FREEMAN, Antony Peter, 11, Lisson Grove, Hale, Cheshire. September 27th, 1955. B.V.SC. (LIV.).

SHEPHERD, Peter Richard, Ashleigh, Leintwardine, Craven Arms, Salop. September 27th, 1955. B.V.SC. (LIV.).

PERSONAL

Births

CHANDLER.—On September 20th, 1955, at Wellington, New Zealand, to Angela Marie Eugénie, wife of R. L. Chandler, B.SC., PH.D., M.R.C.V.S., a son, Nicholas Paul.

REDMOND.—On September 10th, 1955, to Audrey, wife of M. R. Redmond, M.R.C.V.S., Charlton-All-Saints, Nr. Salisbury, a daughter, Judy Rose.

Marriage

MURCHIE—SPENCE.—The wedding took place on Saturday, September 24th, 1955, between Kenneth Murchie, B.SC., M.R.C.V.S., and Catherine Mabel Spence, at Roseburn Church, Edinburgh.

Death

WRIGHT.—The colleagues and friends of Professor and Mrs. J. G. Wright will learn with much regret of the sudden death of Mrs. Wright on Tuesday, October 4th, 1955, after an emergency operation in London on Thursday, September 29th. Mrs. Wright is being cremated at Croydon Crematorium at 11.20 a.m. this morning, Saturday, October 8th.

R.C.V.S. OBITUARY

We record with regret the death of the following member of the profession:—

STEWART, James Douglas, Emeritus Professor of Veterinary Science, of Gladswood House, Gladswood Gardens, Double Bay, New South Wales, Australia. Graduated Edinburgh, May 25th, 1893; died September 17th, 1955.

Professor Stewart was Honorary Associate of the Royal College of Veterinary Surgeons, and we hope to publish a more detailed memoir in a forthcoming issue of the journal.

COMING EVENTS

October

14th (Fri.). Annual Dinner Dance of the South Wales Division, B.V.A., at the Seabank Hotel, Porthcawl, 7.30 p.m.

19th (Wed.). Annual General Meeting of the Northern Division of the Victoria Veterinary Benevolent Fund Ladies Guild in the Northern Hotel, Aberdeen, 2.30 p.m.

20th (Thurs.). Ordinary General Meeting of the South-eastern Division, B.V.A., at the Royal Star Hotel, Maidstone, 2.30 p.m.

General Meeting of the Herts and Beds Division, B.V.A., at 70, Holywell Hill, St. Albans, 7.30 p.m.

22nd (Sat.). General Meeting of the Society of Women Veterinary Surgeons in the Veterinary Hospital, Pembroke Gardens, Liverpool, 2.30 p.m.

26th (Wed.). Meeting of the R.A.V.C. Division, B.V.A., at the Zoological Society of London, Regent's Park, London, N.W.1, 12 noon.

28th (Fri.). Meeting of the Lincolnshire and District Division, B.V.A., at the Saracen's Head Hotel, Lincoln, 2.15 p.m.

29th (Sat.). Autumn Meeting of the Scottish Metropolitan Division, B.V.A., at the Scottish Milk Marketing Board, Newlands Cattle Breeding Centre, Perth, 2.45 p.m.

First Annual General Meeting of the Veterinary Officers' Section of the Ministry of Agriculture Branch of the Institution of Professional Civil Servants in the Auditorium of the Wellcome Research Institute, 183-193, Euston Road, London, N.W.1, 2 p.m.

November

4th (Fri.). The Annual Dinner and Dance of the Royal Counties Division, B.V.A., at the Chequers Hotel, Newbury, 7.30 p.m.

R.C.V.S. EXAMINATIONS

November 4th, Friday.—Pharmacology, etc. Examination (Revised Syllabus). Written Examination.

November 7th, Monday.—Pharmacology, etc. Examination (Revised Syllabus). Oral and Practicals (London and Dublin).

November 8th, Tuesday.—Animal Management Examination, Dublin (Probable date).

December 8th, Thursday.—M.R.C.V.S. Written Examinations.

December 9th, Friday.—M.R.C.V.S. Written Examinations.

December 12th, Monday.—M.R.C.V.S. Practical and Orals commence (Panels "A" and "B").

COUNCIL AND COMMITTEE MEETINGS IN LONDON

Wednesday, November 2nd

10.30 a.m.—Veterinary State Medicine Committee.

2.00 p.m.—Parliamentary and Public Relations Committee.

3.15 p.m.—Home Appointments Committee.

Thursday, November 3rd

10.30 a.m.—Organising Committee.

2.00 p.m.—General Purposes and Finance Committee.

Friday, November 4th

10.30 a.m.—Council.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Ayr. Liffnook Farm, Hurlford, Kilmarnock (Sept. 27).

Derby. Hill Top Farm, Kirk Langley (Sept 24).

Dumfries. Dornock House Farm, Eastriggs, Annan (Sept. 28).

Kircudbright. Senwick House, Borgue (Sept. 24).

Lancs Lane Ends Farm, Little Hoole, Preston (Sept. 26).

Norfolk. Manor Farm, Wortham, Diss (Sept. 24).

Salop. Black Park Farm, Whitchurch; Rhandir-Issa, Croesaubach, Oswestry (Sept. 28).

Somerset. Moat Farm, Marston Bigot, Frome (Sept. 23).

Stafford. No. 12 Holding, Cocknage, Longton, Stoke-on-Trent (Sept. 27).

Yorks. Hopewell House Farm, Hay-a-Park, Knaresborough (Sept. 23); Hedgeholme, Winston, Darlington, Co. Durham (Sept 27).

Fowl Pest

Lancs. Oakleigh, Hall Lane. Longton, Preston (Sept. 25).

Norfolk. Back Street Farm, Garboldisham, Diss (Sept. 23); 61 and 64, Moss's Allotments, Cobholm, Gt. Yarmouth (Sept. 29); 31 and 32, Freehold Allotments, Cobholm, Gt. Yarmouth (Sept 27); 73, 74 and

78, Ferrier's Allotments, Cobholm, Gt. Yarmouth (Sept. 29).

Sussex. Greenvale Farm, Cross-in-Hand, Heathfield (Sept. 23).

Swine Fever

Dorset. Tripp's Farm, Purse Caundle, Sherborne (Sept. 27).

Lanark. Biggins Farm, Bellshill, (Sept. 29).

Lincs. Roseleigh, Railway Lane, Sutton Bridge, Spalding (Sept. 27).

Norfolk. The Lodge, Upper Sheringham, Sheringham (Sept. 26); 117, The Street, Barney, Dereham (Oct. 3).

Northants. Newnham Lodge, Newnham, Daventry (Oct. 3).

Oxon. Trent Farm, Upper Wardington, Banbury (Oct. 3).

Somerset. 44, Fore Street, Chard; Perrings Hill Farm, Tintinhull, Yeovil (Oct. 1).

Suffolk. Bowling Green Inn, Bedingham. Woodbridge (Sept. 28).

Sussex. Benedict House, Ewhurst, Robertsbridge (Sept. 27); Batesons Holdings, Heathfield (Oct. 3).

Warwicks. Pool Meadow Farm, Garetts Lane, Balsall Common; Tachbrook Hill Farm, Leamington Spa (Oct. 3).

Yorks. The Gables, Eastrington, Goole (Sept. 28); The Haven, Folkton, Filey; Poplars Farm, Long Sandall (Sept. 29); Low Farm, Loversall, Doncaster (Oct. 3).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

MYCOTIC DERMATITIS IN GREAT BRITAIN

Sir,—Mycotic dermatitis or "lumpy wool" of sheep has been recorded as affecting sheep in the southern hemisphere (Bull, 1929; Steyn, 1931; Mason & Bekker, 1934). Over recent years we have been studying this condition in England and Wales and can now confirm its presence in Great Britain.

On clinical grounds the condition was suspected in 1949 in a flock of Suffolks in Somerset. In 1951 an outbreak of dermatitis in Suffolk sheep in Rutland was considered to be mycotic dermatitis but laboratory examination and animal transmission work failed to confirm the diagnosis. In 1954 a disease involving some 40 per cent. of a flock of Clun Forest sheep in Somerset strongly resembled mycotic dermatitis as seen overseas. The diagnosis was supported by the demonstration, on direct microscopical examination, of an organism similar to that described by Bull and by successful transmission to unaffected sheep. Similar cases were seen in Herefordshire.

This year widespread outbreaks have occurred throughout the country, particularly in the high rainfall areas of the west. The heavy rainfall which occurred after shearing provoked a flare-up of dermatitis which was alarmingly obvious in the shorn sheep. The timely arrival of a dry summer cut short the progress of the disease. The condition was, this time, definitely diagnosed by the isolation of *Actinomyces dermatonomus* from the lesions, using a Polymixin serum agar.

The observed lesions were generally mild consisting of a crust of scab material some 3 mm. in depth extending over the back and down the flanks. Occasionally dense, 20-mm.-thick zones of scab were observed. The scabs which grow up with the fleece are often weathered out during dry weather but during periods of heavy rain form a dense band which remains in the fleece protected by the winter growth of wool. The organisms in this band act as a reservoir of infection producing recurrences of dermatomycosis whenever the weather conditions are suitable to maintain a sufficiently high moisture content in the depth of the fleece.

The disease is distinct from that described in the recent interesting report by Nisbet & Bannatyne (1955) in that the lesions are confined to the wooled areas of the back and sides and are an extensive mild superficial dermatitis showing no gross tissue changes. The causal organism established by Nisbet & Bannatyne appears to be pyogenic and more virulent than that isolated in outbreaks.

The condition is most prevalent in areas of heavy rainfall and in clay districts. It is difficult to assess the susceptibility of different breeds because of their zonal distribution. The condition has been observed in Clun Forest, Kerry Hill, Suffolk, Southdowns and Shropshires. It is probable that fine close fleeces retain moisture after heavy rain for a much longer period than open wool fleeces and thus maintain a more satisfactory microclimate for the growth of the causal organism.

No very satisfactory treatment is yet available. Bull recommended the use of a wash of copper sulphate (1 lb. to 50 gal.) but this treatment in our hands has not given complete satisfaction. Trials are in progress and we hope to publish full details of this outbreak in due course.

Yours faithfully,

G. J. KANE,
The Cooper Technical Bureau.

W. DOWNING,
The Cooper Technical Bureau.

A. J. WILSDON,
Animal Health Division,
Ministry of Agriculture,
Hereford.

September 21st, 1955.

References

BULL, L. B. (1929). *Austr. J. Expr. Med.* **6.** 3, 301.
STEYN, D. G. (1931). 17th Rept. Vet. Serv. & Anim. Indust. Onderstepoort.
MASON & BEKKER, J. G. (1934). *Onderstepoort J. Vet. Sci. & Anim. Industr.* **3.** 1, 211-216.
NISBET, D. I., & BANNATYNE, C. C. (1955). *Vet. Rec.* **67.** 38, 713-715.

THE INCIDENCE OF *OTODECTES CYNOTIS*

Sir,—With reference to the recent article by my colleague, W. P. Beresford Jones, on " Observations on the incidence of *Otodectes cynotis* on dogs and cats in the London area (*Vet. Rec.*, **67,** 716-7), I am prompted to make one or two observations. He quotes Kaufman and Frost as stating that 56 per cent. of live dogs were found to have otodectic mange (*Vet. Rec.*, **61,** 368). I feel that this gives an incorrect impression as this figure relates to a consecutive series of new clinical cases of otitis and/or pruritus in the dog; I still find that in the London area approximately every other clinical case of otitis in the dog is associated with *Otodectes cynotis*. I think this incidence is quite reconcilable with the approximate 3 per cent. of the London dog population as found by Beresford Jones. Nevertheless, clinical cases that Kaufman and I recorded occurred mostly in dogs under nine months of age and I feel that probably the carcases examined by Beresford Jones under this age were in a definite minority. Also, the 3 per cent. will only include infections not noticed in life or not effectively treated, and hence I think it is fair to suppose that the canine incidence of otodectic mange in practice is higher than suggested.

Yours faithfully,

CHURCHILL FROST.

Royal Veterinary College and Hospital,
Royal College Street,
London, N.W.1.

September 28th, 1955.

ASSISTANTS IN VETERINARY PRACTICE

Sir,—Mr. Field's lively letter in THE VETERINARY RECORD of September 24th, hitting out at all and sundry (not omitting himself) seems to reveal some confusion of thought.

The principals " who religiously attend all meetings " are the architects of the " benefits and privileges " which are to the advantage of *all* members of the profession. I am strongly in favour of assistants being encouraged to attend meetings, which seems to be a matter between principal and assistant, and as I feel sure Mr. Field is neither tame nor humble, he may be able to make arrangements accordingly.

I would say that while the " business " may be carried on by assistants, the " responsibility " rests squarely on the shoulders of the principal, wherever he may be, and as no practice has its receipts enhanced by the absence of the principal, so public service to the profession can only be regarded as a long term investment by those spending their time at it.

The price of practices is wholly determined, as are all other commodities and salaries, by supply and demand. If practices command high prices, there must be a number of assistants wealthy enough to pay them.

If an assistant or anyone else decides to marry young—an arrangement with which I am in entire sympathy—he can only thank himself, but surely he has much compensation.

Mr. Field cannot really believe he is " dependent upon others " for providing him with a living; surely he is dependent upon his own skill and efficiency to secure and keep a job [see paragraph on supply and demand], and in present circumstances he need have no fear of unemployment.

I should be interested to know details of what is meant by the assistant " coming into his own." His own what?

Yours faithfully,

G. S. MUIR.

1, Cedar Hill,
Newport,
Isle of Wight.

September 26th, 1955.

ADVERTISERS' ANNOUNCEMENTS

BURROUGHS WELLCOME & Co. announce the introduction of "Wellcome" brand Penicillin and Dihydrostreptomycin Intramammary Injection. This product, containing 300,000 units Procaine Penicillin G and 250,000 units Dihydrostreptomycin Sulphate in a bland base, covers a wide range of bacterial pathogens in bovine mastitis and is therefore particularly suited for the treatment of cases of mixed infection, and in such of unknown aetiology. The high concentrations in which both antibiotics are presented ensure the maintenance of adequate therapeutic levels in the udder.

"Wellcome" Penicillin and Dihydrostreptomycin Intramammary Injection is issued in single-dose tubes, in boxes of 12.

ALLEN & HANBURYS, LTD. announce that to meet the needs of large users of Veterinary Alficetyn Paint, a 500 c.c. size, with brush, has been introduced.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period		Anthrax	Atrophic Rhinitis	Foot-and-mouth	Fowl Pest	Sheep Scab	Swine Fever
1st to 15th September, 1955		21	1	—	2	—	49
Corresponding period in	1954	12	1	—	3	—	42
	1953	13	—	—	14	—	99
	1952	73	—	8	6	—	28
1st January to 15th September, 1955		523	4	6	383	—	1,107
Corresponding period in	1954	205	4	12	594	—	1,136
	1953	490	—	28	722	—	2,220
	1952	560	—	486	157	1	672